《研究ノート》

Trade and Climate Change Policies: Four Problems

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1. Introduction

This short paper is about some certain particular aspects of the interaction of key driving forces of international relations, trade liberalization and environmental protection. It deals with the relationship between trade policies made to mitigate climate change. It analyzes the nature of Kyoto Protocol, policies that are adopted in response to it, international patterns of trade and their legal framework, and multilateral trading system.

This paper is structured as follows: Section 2 explores the potential impact on patterns of international industrial trade in limiting emissions of greenhouse gases. Section 3 deals with the interaction between trade and the application of standards and labels at a national level. Section 4 examines the potential taxation of sale or consumption of fuels. Section 5 aims at the potential trade issues at stake. And section 6 is a conclusion. This paper owes much to Brack et al. (2000).

2. Trade Impact of Climate Policy

Firstly, theoretical aspects of distortions jurisdictions should introduce into capital taxation and environmental regulation are mentioned. Industry was assumed homogeneous and the extent to which incomes and environmental quality differed among jurisdictions and the effects of such differences on industries with different propensities to pollute are not analyzed. In the international arena, the perspective changes; a dominant characteristic of different countries competing for international trade is differences in income. Poor countries are able to offer a low wage labor force, attracting labor-intensive manufacturing. Poor countries are also able to specialize in pollution-intensive industries. So, here are ways in which lower incomes may influence international trade.

As environmental quality is a normal good, citizens of poorer countries demand lower levels of environmental quality. This result, potentially, in specialization in pollution-intensive manufacturing. On the other hand, it could result in the importation of wastes for disposal. Although the driving factor in both of these cases is the income effect in demand for environment, the issues are different than we encountered in the case of the environmental Kuznets curve (Kolstad, 2000).

The economic issues are complex because there are a lot of difficult effects involved. Measures to limit emissions will reduce demand for fuels. In most developed countries, the transport sector accounts for the bulk of oil consumption, whilst electricity and heating tend to be based more on coal and natural gas. However, large amounts of fuel oil are used for power generation and heat supply, and this combined with measures directed at transport, means oil consumption is also likely to decline (Brack et al., 2000).

The impact on international trade is likely to result from effects on oil consumption. Coal trading is growing, however, most coal is still produced and consumed domestically. The international traded price for coal is far closer to its production cost than is the case for oil; profits are less[1].

The manufacturing of traded products accounts for 20 per sent of CO_2 emissions in most industrialized countries. If CO_2 abatement in developed countries raises the price of energy, this will make potentially advantageous for countries without such policies. However, countries that have taken action to limit CO_2 emissions have avoided policies that would impact on manufacturing. The total exemption of energy-intensive sectors has not gone beyond voluntary agreements. Rebating carbon taxes for exports and imposing them on imports would neutralize the competitive impacts of such taxes, however, the relative prices could be complex and would be subject to change by international institutions'

Table 1 Carbon Content of Fossil Fuels and Atmospheric Accumulation

Carbon in fossil fuels		
	Proven reserves	Additional resources
Conventional oil	120	36–110
Conventional gas	80	45–165
Coal	650	360–2,300
Unconventional oil	142	180
Unconventional gas	105	35–270
Atmospheric accumulation		
	Stabilization level	Allowable emissions*
	450 ppm	630–2100
	550 ppm	870–990

Note) 1990–2100. Kassler and Paterson (1997)

agreements. If measures taken to limit CO_2 emissions have a significant impact on overall consumption, import volumes are likely to fall. Its impact is complex and could be specific. It is also hard to predict. The scale of income related trade effects is debatable and dependent on implementation mechanisms. Measures in industrialized countries will have price as well as volume. If emissions reduction policies change the relative prices of goods, this could increase the imports not only energy related goods, but also energy efficient goods[2]. Table 1 is carbon content of fossil fuels and atmospheric accumulation

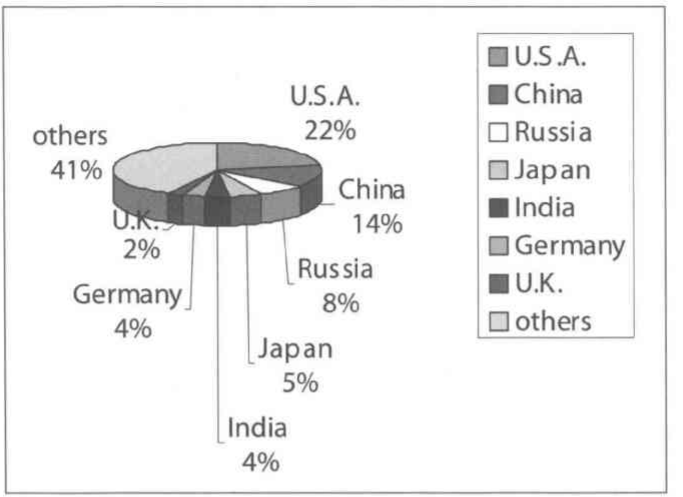
The final means by which developed countries' abatement of green gases may affect other countries lies in the reduction of climatic changes. For most countries, the more rapid the rate of climate change, the more difficult and costly the adjustment process will be. Reducing the rate and degree of direct climate change impact is the most obvious benefit to flow from an industrialized country limiting climate change.

The effects on oil markets appear likely to dominate other mechanisms. This implies a small economic gain in terms of trade for the majority of developing countries with losses concentrated on the countries that depend primarily on oil or coal exports. Though direct financial compensation is neither technically nor politically feasible, various short-term and long-term measures could be explored, to minimize the impacts on exporters' revenue and to help these countries adjust.

3. Trade Efficiency and Energy

The application of minimum standards of energy efficiency, and of labels showing energy consumption, is becoming more widespread in countries aiming at reducing energy demand and emissions of carbon

Figure Carbon Dioxide Emissions by Countries



Source) Carbon Dioxide Information Analysis Center, 1995

dioxide. In these circumstances, the attraction of minimum standards of energy efficiency is obvious. Standards can be seen as correcting for market failure by lowering informational costs and removing the worst performing units from the market. The perceived political costs of introducing standards are much lower than the costs of introducing or raising energy taxes. Economic evaluation shows existing standards to be highly cost effective, with the value of energy savings exceeding the administrative and other identifiable costs. For these, energy labels and standards seem to become more common[3]. The figure is carbon dioxide emissions by countries.

The potential for trade barriers arising from different national standards is obvious. Exporters, particularly those from developing countries may find it difficult to meet the standards applied by industrialized countries with more developed legislation. However, this

may be true in theory, no search has been able to find the answer in practice. The idea that energy efficiency standards do not present serious barriers to trade is not too surprising when the levels of the standards are considered. Whether countries exports become less competitive in international markets or not is also uncertain.

Manufactures tend to resist the setting of mandatory efficiency standards partly because of the potential administrative costs of compliance, but the strongest opposition generally comes from manufacturers who would have to change their current practice and product lines to comply (Brack et al., 2000).

This manufacturing resistance is important in the political process of setting standards, which generally involve negotiating with manufacture's and their trade assistance. It tends to drive their levels down towards the lowest common denominator among the main manufacturers and to make the process of ratcheting up standards very slow. Industry resistance may decline as climate change becomes more widely accepted as a major issue and if energy taxation, for example, are seen as less palatable alternatives, but still important (Brack et al., 2000).

This also has important implications for reasons of whether standards should be harmonized from the outset. In the U.S., the development of energy efficiency standards has been led by individual states. In the EU, the emphasis has been on trying to harmonize efficient standards from the outset. As a result, progress has been slow. Such circumstances might raise extreme caution about proposals to try and harmonize global standards under Kyoto Protocol.

Product standards are static instruments that can act to frustrate dynamic and innovative developments. Standards will often need to vary with factors such as consumer preferences or other national regulations.

Moreover, monitoring and enforcement costs could be significant, along with the rate of technological innovation and the complex technical nature of standards (Brack et al., 2000).

In theory, environmental regulations cost polluters money. Firms subject to tighter environmental regulations will incur higher costs than firms subject to weaker or nonexistent environmental regulations. If two countries identical in all respects except for the tightness of environmental regulations exist, economic theory would indicate that the country with weaker environmental regulations would be advantageous to polluting industries and tend to specialize in cleaner industries and import the output of dirty industries. This is a natural conclusion from standard international trade theory (Baker and Kohler, 1997; Kolstad, 2000). Reducing the barriers to achieving international cooperation on the control tans-boundary pollution.

4. International Taxation

The price of energy to its final user is a key determinant of the demand for its use. The price of carbon-based fuels – coal, oil, and gas – is therefore an important influence on emissions of carbon dioxide. Governments can exert influence on the prices produced by the market in a number of ways. Applying tax is one example.

The taxation of energy use or of carbon emissions as a policy option to mitigate climate change is increasingly being considered by industrialized countries. Article 2 of the Kyoto Protocol commits parties to implement progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsides an all greenhouse gases emitting sectors. A number of countries, mainly in northern

Table 2 Energy Taxes in European Countries

Country	Tax	Heavy fuel oil (£/1000kg)	Natural gas (pence/m^3)	Coal (£/1000kg)	Electricity (pence/kWh)
Austria	Energy	26.2	3.5	0	0.6
Denmark	Carbon	30.1	2.1	22.8	10
Finland	Carbon	37.6	1.2	28.9	4.1
Netherlands	Carbon/energy	0	21.3	0	3
	Energy	10.3	10.5	7.4	0
Norway	Carbon	34.9	n.a.	34.2	0
Sweden	Carbon	44	3.1	34.6	0
	Energy	57.2	1.8	23.5	11.5

Source) UK Treasury (1998)

Europe, have already introduced energy or carbon taxes explicitly for environmental reasons. The examples are as Table 2.

Progress outside the EU has been less impressive. In the U.S. BTU tax was put forward by the new Clinton administration in 1993. It would have significantly increased fuel prices for all end users, consumers and producers[4].

Although theoretical results are not in dispute, its empirical significance is of policy interest. If a significant amount of such specialization exists, the establishment of free trade areas may be of concern not only to traditional constituents, but also to environmental groups.

The impact of carbon and energy taxation on international competitiveness has been a constant concern to policy-makers introducing taxes. It seems evident that the imposition of additional costs on firms through energy taxation will affect negatively their competitiveness. It should be noted, however, that this is not necessarily always the case. There are opportunities for energy efficiency investments (Pezzey, 1992).

Furthermore, if the tax doe not trigger any behavioral response, the impact on total costs is likely to be low, when compared with other factors such as exchange rate variations (Brack et al., 2000).

It may therefore be desirable for a number of reasons to introduce policy measures that offset any real negative competitive impacts arising from carbon or energy taxes. There are three possibilities; exemptions, recycling and border tax adjustments. The first two of three measures have many drawbacks. However, border tax adjustments have an argument for the useful as a compensatory or as a protective measure. When considering border tax adjustments for carbon or energy taxes, however, the use is complicated. The practicalities of the tax adjustment processes and the interrelationship of tax with the multilateral trading systems are important and should be considered.

Finally, the taxation of international tax poses difficult questions of feasibility. The removal of tax exemption of international tax will be effective if it is applied at a global level, however, this is probably impossible in the short run. Given this, there are advantages to be gained from sub-global taxation of aviation bunker fuels in some form.

5. Trade and Flexibility Mechanisms

The flexibility mechanisms of the Kyoto Protocol – Article 6, 12, and 17 form the flexibility aspects of the agreement. They present the wholesale utilization of market-based mechanisms for environmental ends. They present for the first time in an international environment protection treaty.

The various agreements comprising the multilateral trading system, and the Kyoto Protocol are legal documents, however, they are also

political issues. I can speculate on the relationship between them, but the final analysis will be settled by negotiation between the parties to both sets of treaties. And whether the aims of trade liberalization and of environmental protection are best served by keeping the WTO and the Protocol are important.

The clean development mechanism (CDM) potentially creates an important proxy market for carbon abatement in developing countries. However, the GATT or WTO has not decided how to solve it. The TRIMS or MAI was far more wider. These considerations are entirely hypothetical: the MAI has been abandoned and it seems unlikely that the OECD will take it up. The potential for clashes between the MAI and the CDM should provide some valuable lessons for the design of any such future agreement.

The resolution of the issue will be a slow process, though there are sign that countries' positions are moving closer together. The flexibility mechanisms are designed to begin operations much earlier than the first commitment of the Kyoto Protocol. The Kyoto Protocol contains requirements for data reporting which start immediately after it comes into force, so these add to the pressure.

The trade measures of the Montreal Protocol have been a vital element in securing the success of the agreement; in principle similar provisions may have an important role to play. Ideally, the presence of trade measures should provide a sufficient incentive to result in universal participation, however, it has obvious limits. Trade measures are likely to continue to play a role as one component of effective environmental agreements and should be contemplated as part of the evolving climate change regime. The Montreal Protocol also led to the establishment of restrictions on trade between parties. The Protocol requires parties to

control both consumption and production. A variety of trade restrictions have been employed. In addition, in response to concern over growth in illegal trade in CFCs, an amendment was agreed to. The information in Table 3 is derived from the 1992 World Development Report of the World Bank.

The key to resolving the trade-environment debate in the context of international agreements lies in striking the right balance between trade liberalization and environmental protection in any given set of circumstances. While it may well be the case that trade restrictions are helpful, or essential in enforcing implementations such as the Kyoto Protocol. It does not follow that any trade-restrictive measure that may be

Table 3 Pollutions, GNP and Energy

Year	Kind	Level	Percentage		
		All countries	Low-income countries	Middle-income countries	High-income countries
1965					
	Pollution	3 billion	58	20	22
	GNP	8 trillion	4	10	86
	Energy	3 billion	7	15	78
1990					
	Pollution	5 billion	62	22	16
	GNP	19 trillion	6	12	82
	Energy	7 billion	15	22	63
2025					
	Pollution	8 billion	65	24	11
	GNP	55 trillion	9	16	75
	Energy (high)	21 billion	34	29	37
	(medium)	15 billion	34	29	37
	(low)	11 billion	34	29	37

Source) World Development Report 1992

adopted under the treaty's aegis is desirable. In most cases, it seems unlikely that discrimination in trade would be necessary to achieving the environmental aims of the treaty. Nevertheless, in some cases it may be. This provides one further area of potential interaction between the two objectives of trade liberalization and environmental protection, and one further item of discussions on the topic of climate change policies and their interaction with trade.

For Kyoto Protocol, United States has not agreed to sign it. Japan explained its position regarding the Kyoto Protocol and its efforts to achieve its commitments under the Kyoto Protocol. Both countries exchanged views regarding their policies. Both will take enhanced actions to contribute to addressing the long-term problem of climate change consistent with the objective of the Protocol. In this regard, the two countries recognize the importance of high-level consultations and agree to their continuation. First of all, they have to explore common ground and areas for common action on climate change.

6. Conclusions

Two recent international agreements recognized the need for adjustments. The Montreal Protocol on the phasing out of chlorofluorocarbons is one of these agreements. This agreement made explicit financial provisions. The second agreement is the Kyoto Protocol, on cutting greenhouse gas emissions (Dore and Mount, 1999). While this agreement does not have the financial provisions, it recognizes that the time needed for adjustment must be equitable, and contains different schedules for CO_2 reductions for industrial countries. It remains to be seen whether the U.S. Congress will ratify it.

To solve global environmental problems is not easy and this paper does not show this. Traditional analysis answer these issues, however, new economics can handle these. Government policies to reduce environmental pollution and global warming are often criticized as damaging to the economy, particularly by reducing international competitiveness[5]. This paper addresses the issue by examining many of the policies concerned, and the effects on international competitiveness. I think that well-refined, market-oriented environmental policies may be expected to improve the welfare.

Global warming is a serious issue for human beings today, and for the existence of human beings in the future. We must combine our knowledge and wisdom to find solutions to this serious problem. It will not be easy for Japan to achieve the aims of the Kyoto Protocol, as its energy efficiency already reaches the world's highest levels. However, efforts to solving the problem of global warning is essential to building a socio-economic system with environmentally sound material cycles and in harmony with the environment, which will make possible the emergence of a sustainable society. To achieve this goal, Japan will seek to strengthen efforts which can attract the participation and cooperation of every social actor, mobilize every possible policy measure, and promote comprehensive actions in a systematic way to achieve reductions. It is necessary to promote measures both in the public and private sectors to prevent global warming with the understanding and cooperation of citizens.

Notes

1. A study by OPEC showed that OPEC's revenue would reduce. See OPEC (1993).
2. Large scale models which seek to incorporate these abatement issues support these facts.
3. The value of energy savings exceeds administrative and other identifiable costs. Cost saving is not always apparent to the consumer where energy production is subsidized because they face lower prices. See, Mullins (1996).
4. However, the total scale of energy taxation would still have been lower than that in most European countries.
5. See, for example, Oates (1997).

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